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10/594,230	07/02/2007	Robert James Foulger	41557-236805	1825

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EXAMINER	
CHI, SUBERR L	
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2818	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,230	FOULGER ET AL.	
	Examiner	Art Unit	
	SUBERR CHI	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-7 and 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-7 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The previously issued 112 2nd paragraph rejection(s) is withdrawn in view of the amended claims.

2. The Applicants' arguments with respect to claims #1, 2, 4-7, 9 in the reply filed on 10/29/2010 have been carefully considered, but are not persuasive and the previous rejection maintained. Multiple rejections are also provided herein.

3. As to the Applicants' arguments that Ohkubo does not teach support tabs, the Examiner respectfully disagrees. The electrically conductive support tabs correspond to [5], and the supporting structure corresponds to [71]. Applicants' claims as presently written do not preclude the removing of the supporting structure, in this case, Ohkubo removes the supporting structure comprising bonding wax by a solvent. Each of Ohkubo's elements is attached to at least one portion of [71] and a neighboring element by electrically conductive support tab [5].

As to the Applicants' arguments that Ho is nonanalogous prior art, the Examiner respectfully disagrees. Ho is not limited only to open-circuit testing; Ho's invention is more broadly directed towards semiconductor packaging technologies **(Ho: Field of the**

Invention), which Ohkubo is also concerned with. Applicants' arguments relating to Ho as non-analogous art are therefore considered moot.

Thus, the combination of Ohkubo and Ho still provides a method for manufacturing an array of discrete elements.

Claim Rejections – 35 USC § 112, 2nd ¶

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim(s) 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. As to claim 9, there is a lack of antecedent basis for the limitation of "**the** element". Which element is being referred to, the selected element or the neighboring element?

Claim Rejections - 35 USC § 103(a)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 103 that form the basis for the rejections under this section made in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims #1 and 2 are rejected under 35 USC 103(a) as being obvious over Ohkubo et al (US Patent #5,418,181, as cited in the IDS hereafter Ohkubo) in view of Ho et al (US Patent #6,380,059, hereafter Ho).

5. As to claim 1, Ohkubo teaches:

a. Manufacturing an array of said discrete elements (**Fig. 11, disclosed as [9] but not shown in Fig. 11**) wherein each element is attached to at least one of a supporting structure (**Fig. 9D, portion of [71] surrounding each [9]**) and at least one other element (**Fig. 9D, neighboring element [9]**) by at least one electrically conductive support tab (**Fig. 9D, [5]**). The manner in which claim 1 is presently written does not require the supporting structure to also be electrically conductive. Support tab [5] comprises gold, which is electrically conductive.

However, Ohkubo does not teach selectively removing or breaking the at least one support tab supporting one of the discrete elements, wherein the at least one support tab is removed or broken by passing a current therethrough.

On the other hand, Ho teaches electrically conductive support tabs (**Ho: Fig. 2A, [41]**) which may be broken (**Ho: Fig. 2B**) by passing a current therethrough (**Ho: col. 3, lines 57-63**). Ho's fuse structures [41] correspond to Ohkubo's support tabs, and Ho's fuse structures [41] are selectively removed.

It would have been obvious to one of ordinary skill in the art to combine the overall method of forming an array of discrete elements with support tab-fuse type structures as taught by Ohkubo, with the method of selectively removing the tabs via current as taught by Ho, because both are from the same field and endeavor, and both are directed to fuse-type structures and packaging technologies.

Furthermore, the breaking of the tab-fuse structures yields the predictable result of facilitating open-circuit testing **(Ho: col. 1, lines 6-14)**.

6. As to claim 2, Ohkubo teaches:

   a. Manufacturing an array of Gunn diodes **(Fig. 11, disclosed as [9] but not shown in Fig. 11; "Brief Description of the Drawings" teaches Gunn Diodes)** wherein each Gunn diode is attached to at least one of a supporting mesh **(Fig. 4, [4])** and at least one other Gunn diode **(Fig. 9D, any neighboring Gunn diode)** by at least one electrically conductive support tab **(Fig. 9D, [5]).** In Fig. 4, the Gunn diode is initially attached to a supporting mesh structure [4].

However, Ohkubo does not teach selectively removing or breaking the at least one support tab supporting one of the Gunn diodes wherein the at least one support tab is removed or broken by passing a current therethrough.

On the other hand, Ho teaches electrically conductive support tabs **(Ho: Fig. 2A, [41])** which may be broken **(Ho: Fig. 2B)** by passing a current therethrough **(Ho: col. 3, lines 57-**

63). Ho's fuse structures [41] correspond to Ohkubo's support tabs, and Ho's fuse structures [41] are selectively removed.

It would have been obvious to one of ordinary skill in the art to combine the overall method of forming an array of discrete elements with support tab-fuse type structures as taught by Ohkubo, with the method of selectively removing the tabs via current as taught by Ho, because both are from the same field and endeavor, and both are directed to fuse-type structures and packaging technologies.

Furthermore, the breaking of the tab-fuse structures yields the predictable result of facilitating open-circuit testing **(Ho: col. 1, lines 6-14)**.

Claim #2 is rejected under 35 USC 103(a) as being obvious over Ho in view of Ohkubo.

7. As to claim 2, Ho teaches:

   a. Manufacturing an array of devices **(Fig. 1, [30]; col. 1, lines 23-32; individual package units obtained from singulating each package site)** wherein each device is attached to at least one of a supporting mesh **(Fig. 1, [20])** and at least one other device **(Fig. 1, neighboring chips [30] on adjacent package sites [11])** by at least one electrically conductive support tab **(Fig. 1/2A, [40]).** The same structures are used for prior art Fig. 1 and exemplary embodiments of Figs. 2A/2B.

b. Selectively removing or breaking **(Fig. 2B)** the at least one support tab supporting one of the devices wherein the at least one support tab is removed or broken by passing a current therethrough. The constricted segment [41] portion of support tab [40] is broken by passing an electrical current therethrough **(col. 3, lines 57-62)**.

However, Ho does not teach the devices comprising Gunn diodes.

On the other hand, Ohkubo teaches devices comprising Gunn diodes **(Ohkubo: col. 1, lines 7-12)**, for mass production.

It would have been obvious to one of ordinary skill in the art to combine the overall method of singulating individual devices using an electric current as taught by Ho, with devices such as Gunn diodes as taught by Ohkubo, because both Ho and Ohkubo are from the same field and endeavor and both are directed to producing discrete elements.

Furthermore, the application of Ho's method towards the production of Gunn diode devices enables the predictable result of cost-effectively mass producing devices for high frequency applications, as Gunn diodes are suited towards.

Claim Rejections 35 USC § 102(b)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim #1 is rejected under 35 U.S.C. 102(b) as being anticipated by Ho.

8. As to claim 1, Ho teaches:

a. Manufacturing an array of said discrete elements **(Fig. 1, [30]; col. 1, lines 23-32; individual package units obtained from singulating each package site)** wherein each element is attached to at least one of a supporting structure **(Fig. 1, [20])** and at least one other element **(Fig. 1, neighboring chips [30] on adjacent package sites [11])** by at least one electrically conductive support tab **(Fig. 1/2A, [40]).** The same structures are used for prior art Fig. 1 and exemplary embodiments of Figs. 2A/2B.

b. Selectively removing or breaking **(Fig. 2B)** the at least one support tab supporting one of the discrete elements wherein the at least one support tab is removed or broken by passing a current therethrough. The constricted segment [41] portion of support tab [40] is broken by passing an electrical current therethrough **(col. 3, lines 57-62)**.

Claim #4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Urban (US Patent #5,549,240, hereafter Urban).

9. As to claim 4, Urban teaches:

a. A first portion **(Fig. 4, [14])** to break through an electrically conductive connection **(Fig. 4, [56])** between the selected element and a neighboring element by passing a

current through the connection. Legs [14] comprising a first portion, are electrically conductive, and are heated by electric current/resistance heating **(col. 3, lines 54-60)**. The legs then melt the solder connections [56], and after melting, the element is lifted from the circuit board **(col. 5, lines 57-60)**. Urban teaches that this method may be used for removal of electrical components from a circuit board **(col. 1, lines 7-10)**, thereby suggesting neighboring devices. The solder connections [56] are still between the selected element and neighboring elements, though not necessarily directly between the elements.

b. A second portion **(Fig. 5, [12])** to pick up the selected element from the array. The flexible carrier plate [12] enables pickup of the selected element.

10. As to claims 5 and 6, Urban teaches electric current resistance heating through legs [14] which are in turn imparted to the solder connections [56].

Claim Rejections - 35 USC § 103(a)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 103 that form the basis for the rejections under this section made in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim #7 is rejected under 35 USC 103(a) as being obvious over Urban in view of Ohkubo.

11. As to claim 7, Urban teaches a selected element, but does not teach the selected element comprising a Gunn diode.

On the other hand, Ohkubo teaches elements comprising Gunn diodes (**Ohkubo: col. 1, lines 7-12**), for mass production.

It would have been obvious to one of ordinary skill in the art to combine the overall apparatus for singulating individual devices using an electric current as taught by Urban, with devices such as Gunn diodes as taught by Ohkubo, because both Urban and Ohkubo are from the same field and endeavor and both are directed to producing discrete elements.

Furthermore, the application of Urban's apparatus towards the production of Gunn diode devices enables the predictable result of cost-effectively mass producing devices for high frequency applications, as Gunn diodes are suited towards.

Claim #9 is rejected under 35 USC 103(a) as being obvious over Urban as applied to claim 4.

12. As to claim 9, Urban teaches an element, but does not specify the particular shape.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to alter the shape of the element, since a change in shape is generally recognized as being within the level of ordinary skill in the art.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUBERR CHI whose telephone number is (571)270-3955. The examiner can normally be reached on 9-5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571)272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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